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United States
Department of
Agriculture
Soil
Conservation
Service
Montana
Agricultural
Experiment
Station
Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow
Forecasts as of
March 1, 1984

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
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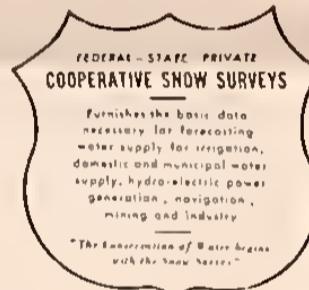
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DID YOU MISS SOMETHING?

On the front page of the February 1 Water Supply Outlook for Montana, we asked for your help in identifying snow courses that you need for your operations.

If you missed the article or meant to respond but didn't, we can still incorporate your comments in the second phase of our study. Details are explained in the February 1 Outlook.



Drastic changes needed!

Small mountain ranges in central Montana showed some improvement in snowpack conditions but the rest of the State remained about the same or declined.

Most of the mountain headwaters have below to well below average accumulation of snow.

The area along the Continental Divide north of MacDonald Pass to Canada, has snow water content near record lows.

Over 80 percent of the snow accumulation season has passed. A drastic change in weather patterns will be required to show any major improvement in this year's snowpack. Usually the season's maximum accumulation of snow water levels occurs around mid-April.

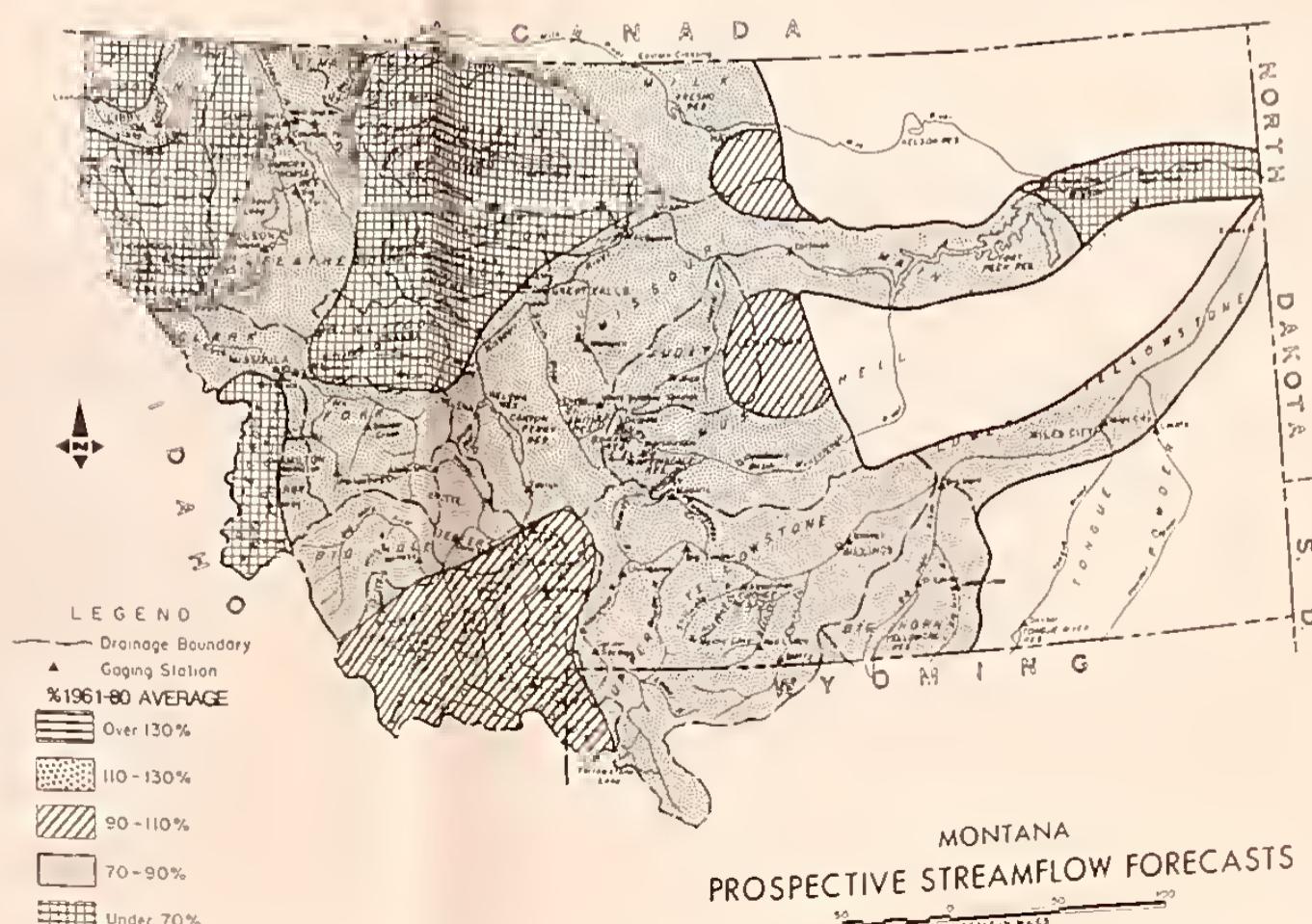
The normally heavy snowfall areas in northwest Montana would require 200 to 300 inches of snowfall during March in order to reach average water content levels by the first of April.



Irrigation water shortages anticipated

The southwest corner of the State and two areas in central Montana will have near average to a little below average runoff. All other areas are forecast to have below to well below average water supply this spring and summer.

Irrigation shortages could vary from moderate to severe in these areas depending on water rights, stored water and temperatures and precipitation during the next few months. Weather patterns have not been favorable for picking up moisture since December. If this pattern continues through this summer, extensive water shortages can be anticipated.

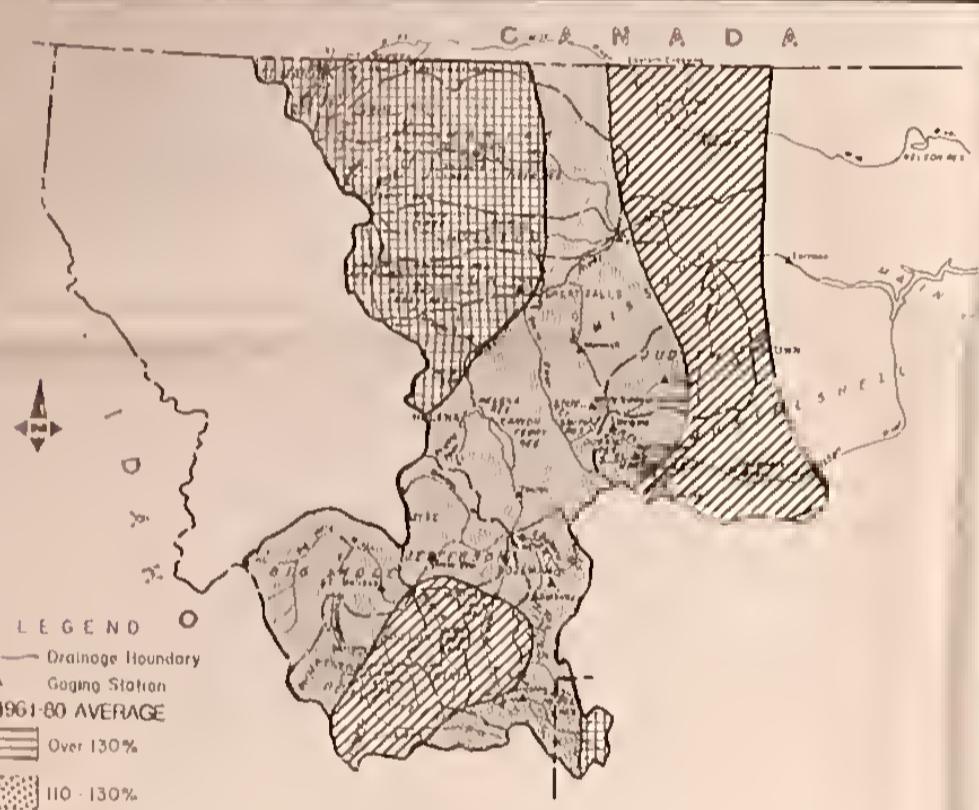


Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN STREAM AND FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	THOUSAND CFS	PERCENTAGE						
	APRIL - SEPTEMBER	APRIL - JULY						
RED ROCK RIVER near Monida (1)	102	99	186	103	96.0	100	159	96.3
BEAVERHEAD RIVER near Grant (2)	150	95	250	158	132	96	197	137
BEAVERHEAD RIVER at Barratts (2)	195	93	209	171	95	180		
RUBY RIVER near Alder	105	104	101	90.0	106	84.6		
BIG HORN RIVER near Melrose	570	75	760	520	74	698		
BOULDER RIVER near Boulder								
WILLOW CREEK near Harrison	18.5	92	20.0	16.7	94	17.8		
HAZARD RIVER near Greyling (3)	454	92	532	496	357	92	408	388
HAZARD RIVER near McAllister (4)	800	94	947	848	632	94	749	672
GALLATIN RIVER near Gateway	504	92	534	545	434	94	451	464
INFLOW MIDDLE CREEK RESERVOIR near Bozeman (5)	26.4	92	26.3	28.6	22.8	92	22.5	24.7
HYALITE CREEK near Bozeman (6)	40.5	90	44.8	35.4	91	38.7		
GALLATIN RIVER at Logan	547	90	611	469	90	523		
MISSOURI RIVER at Toston (7)	2137	84	2885	2545	1841	84	2385	2196
SHEEP CREEK near White Sulphur Springs	17.5	80	16.8	21.8	15.0	79	13.0	19.0
SUN RIVER at Gibson Dam (8)	295	52	349	570	260	50	304	522
DELT CREEK near Monarch	102	76	134	95.0	77	123		
MISSOURI RIVER at Fort Benton (9)	2955	74	3,980	2560	74	3,468		
TWO MEDICINE CREEK near Browning (10)	158	64	248	145	62	235		
BADGER CREEK near Browning	83.0	64	130	70.0	62	113		
CUT BANK CREEK at Cut Bank	70.0	61	114	64.0	59	108		
HARIAS RIVER near Shelly	290	54	247	542	270	52	232	518
MISSOURI RIVER at Virgiline (11)	3235	71	4,570	3240	71	4,030		
NORTH FORK MUSSEL-HELL RIVER near Delpine	4.6	72	6.4	3.8	70	4,383		
SOUTH FORK MUSSEL-HELL RIVER above Martindale	44.5	71	62.8	41.3	70	58.9		
MISSOURI RIVER below Fort Peck Dam (11)	3440	69	4,961	3050	69	4,428		
MILE RIVER at Eastern Crossing*	249	91	275					
MILK RIVER at Eastern Crossing (12)*	82.8	76	109					
INFLOW LAKE SAKAKAWEA, ND (11)	9310	73	12,755	8475	73	12,239		
SASKATCHEWAN RIVER BASIN								
SWIFTCURRENT CREEK at Sherburne (13)	98.0	77	100	128	85.0	76	87.9	112
ST. MARY'S RIVER near Babb (13)	370	76	487	310	75	416		

*March-September Forecast



MISSOURI RIVER & HUDSON BAY DRAINAGES MONTANA MOUNTAIN SNOW WATER EQUIVALENT

Below average snowpack continues

Smaller mountain ranges in the central part of the State showed a slight improvement in snowpack conditions. However, the rest of the Missouri River drainage maintained about the same snow cover percentage or dropped a little from last month.

Many of the snow measurements along the Continental Divide from McDonald Pass north, show near record lows for water content. Storm activity increased during the last week of February but was not enough to overcome 3 weeks of dry weather.

Even if precipitation becomes average for the next 2 months, most of the area will still have below average snowpack for the season.

Normally, about 82 percent of the season's snowpack is accumulated by March 1. The maximum levels of water stored in the snow usually occur around mid-April.

STREAM or AREA	WATER SUPPLY OUTLOOK	
	Spring Season	late Season
Beaverhead	Fair	Fair
Ruby	Avg	Avg
Big Hole	Fair	Fair
Boulder	Fair	Poor
Jefferson	Fair	Fair
Madison	Fair	Fair
Gallatin	Fair	Fair
West-Side Missouri	Fair	Poor
Smith-Belt	Fair	Poor
Sun	Poor	Poor
Teton	Poor	Poor
Harias	Poor	Poor
Judith	Fair	Fair
Musselshell	Fair	Fair
Milk	Poor	Poor
Bear Paws	Avg	Avg
St. Mary's	Fair	Poor



Snowpacks in some mountain ranges of southwest Montana are near average.

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN STREAM AND FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	THOUSAND CFS	PERCENTAGE						
	APRIL - SEPTEMBER	APRIL - JULY						
YELLOWSTONE RIVER at Corwin Springs	1670	82	1725	2,027	1390	82	1397	1,686
YELLOWSTONE RIVER near Livingston	1970	83	2,379	1617	82	1,969		
BOULDER RIVER at Big Timber	298	75	398	275	75	366		
STILLWATER near Absarokee (1)	496	78	632	410	78	528		
CLARKS FORK RIVER near Selby	450	72	628	405	72	563		
ROCK CREEK near Red Lodge	46.0	76	60.5	37.0	75	49.5		
INFLOW COONEY RESERVOIR near Boyd (2)	3617	81	3133	4,516	3062	80	3793	3,833
YELLOWSTONE RIVER at Billings	1466	74	2060	1,976	1325	74	1849	1,794
HIGHORN RIVER near St. Xavier (3)	155	85	182	135	83	162		
LITTLE BIGHORN RIVER near Hardin	235	87	269	211	86	244		
TONGUE RIVER near Decker	286	78	6,787	4600	78	5,906		
YELLOWSTONE RIVER at Miles City (4)	213	81	263	196	81	243		
POWDER RIVER at Moorhead	5760	77	7,518	5040	77	6,544		
YELLOWSTONE RIVER near Sidney (5)								

(1) Adjusted for storage in Lima Reservoir.
 (2) Adjusted for storage in Lima and Clark Canyon Reservoirs.
 (3) Adjusted for storage in Hebgen Lake.
 (4) Adjusted for storage in Hebgen Lake and Ennis Lake.
 (5) Sun of West Fork Hyalite Creek and East Fork Hyalite Creek above the Reservoir.
 (6) Adjusted for storage in Middle Creek Reservoir.
 (7) Adjusted for storage in Lima, Hebgen, Ennis & Clark Canyon Reservoirs.
 (8) Adjusted for storage in Gibson Reservoir & diversions.
 (9) Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Fishkunk, Willow Creek & Canyon Ferry Reservoirs.
 (10) Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
 (11) Adjusted for all upstream reservoirs.
 (12) Flow at Eastern Crossing minus St. Mary's Canal.
 (13) Adjusted for storage in Lake Sherburne.

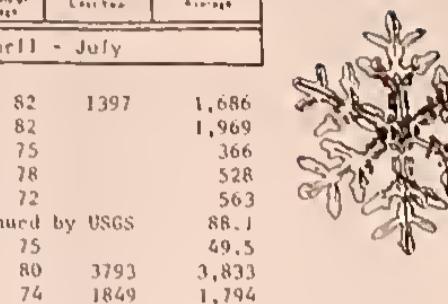
ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Yellowstone snowpack remains low

Snowpack conditions improved a little in the Crazy Mountains but remained about the same or dropped in other areas.

The headwaters of the Yellowstone River in Yellowstone National Park have well below average levels of water stored in the snowpack. Storms began moving through the area near the end of February but were not intensive enough to overcome earlier dry periods.

The outlook for March is not favorable for any significant improvement in the snowpack.



STREAM or AREA	WATER SUPPLY OUTLOOK	
	Spring Season	late Season
Yellowstone at Livingston	Fair	Poor
Shields	Fair	Fair
Boulder	Fair	Poor
Sweetgrass	Big	
Timber	Avg	Fair
Stillwater	Fair	Poor
Rock Creek	Fair	Poor
Clark's Fork	Fair	Poor
Yellowstone above Bighorn	Fair	Poor
Bighorn	Fair	Fair
Little Bigh		

SNOW SURVEY DATA

SHOW March 1, 1984

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

SNOW March 1, 1984

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

SNOW March 1, 1984

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

SNOW March 1, 1984

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

ABUNDANCE LAKE 8800 3/02 50 13.4 15.9 17.6

AMBROSE 6480 2/24 35 8.2 9.4 11.8

ARCH FALLS 7350 2/27 36 9.4 7.8 10.7

ASHLEY DIVIDE 4820 2/24 18 3.3 4.8 6.9

ASHLEY LAKE 4000 2/24 15 3.3 4.9 6.3

BADGER PASS 6900 2/29 58 19.7 24.3 35.3

BADGER PASS PILLOW 6900 3/01 16.6 19.6 28.1

BALD EAGLE PEAK 5700 2/27 88 33.2 42.9 54.8

BALD RIDGE 7500 2/29 42 10.5 8.6 11.3

BANFIELD MOUNTAIN 5600 2/27 34 9.0 20.3 21.6

BANFIELD MOUNTAIN PILLOW 5600 2/27 SP 8.6 18.9 17.0

BAREE CREEK 5500 2/28 68 24.6 38.9 42.5

BAREE MIDWAY 4600 2/28 52 14.5 30.6 33.4

BAREE TRAIL 3800 2/28 11 2.5 4.8 9.4

DARKER LAKES PILLOW 8250 3/01 SP 8.9 14.6 13.1

BASIN CREEK 7180 2/27 27 4.7 7.6 6.7

BASIN CREEK PILLOW 7180 3/01 SP 5.0 6.1 6.0

BASSO PEAK 5150 3/01 13 3.2 7.2 9.7

BEAGLE SPRINGS 8850 3/01 32 5.8 7.0 7.2

BEAGLE SPRINGS PILLOW 8850 3/01 SP 6.5 5.9 6.5

BEAR BASIN 8150 2/28 53 16.0 16.2 18.8

BEAR PAW SKI AREA 5200 2/28 23 7.0 3.8 6.8

BEAVER LAKE 5900 2/29 35 10.4 13.4 21.0

BERRY MEADOW 7000 2/28 18 4.8 6.2 7.2

BIG CREEK 6750 2/28 85 29.4 38.3 39.1

BIG SKY 7700 2/28 46 12.6 12.6 13.5

BIG SKY MEADOW 6350 2/28 36 9.6 7.8 9.0

BIG SNOWY 7150 2/29 59 19.2 12.5 18.2

BLACK BEAR 7950 2/27 89 30.0 39.7 35.3

BLACK BEAR PILLOW 7950 3/01 SP 25.8 33.2 31.6

BLACK MOUNTAIN 7750 3/02 46 12.4 11.2 12.3

BLACK PINE 7100 2/29 29 6.8 9.0 12.5

BLACK PINE PILLOW 7100 3/01 SP 8.0 8.6 12.5

BLOODY DICK 7600 2/28 36 9.2 10.5 12.1

BLOODY DICK PILLOW 7550 3/01 SP 5.4 9.7 10.7

BLUE LAKE 5900 2/29 38 11.9 17.0 23.7

BOOTS SOTS 7750 2/27 30 5.9 5.8 6.6

BOULDER MOUNTAIN 7950 2/24 53 15.2 14.4 16.9

BOULDER MOUNTAIN PILLOW 7950 3/01 SP 16.3 16.8 18.2

BOX CANYON 6670 2/28 26 6.8 7.2 10.9

BOX CANYON PILLOW 6700 3/01 SP 6.2 5.3 8.1

BOXFELDER CREEK 5100 2/28 26 7.2 5.6 7.9

BRANHAM LAKES 8850 3/02 79 25.6 25.2 25.7

BRIDGER BOWL 7250 2/29 64 20.2 16.5 24.0

BRIDGER BOWL PILLOW 7250 2/29 SP 17.8 16.5 22.0

BRISTOW CREEK 3900 2/27 15 4.2 9.0 11.6

BRUSH CREEK TIMBER 5000 2/27 20 5.0 7.6 9.4

BULL MOUNTAIN 6600 2/28 18 4.1 5.8 5.2

CABIN CREEK 5200 2/27 1 0.1 3.2 6.8

CALL ROAD 8050 3/01 38 10.0 10.2 10.0

CALVERT CREEK 6430 2/27 30 6.6 9.6 10.5

DRAINAGE BASIN AND SNOW COURSE

THIS YEAR

PAST RECORD

NAME Elevation Date of Survey Snow Depth (Inches) Water Content (Inches) Water Content (Inches) Last Year Average

FRED BURR PASS 8000 2/29 61 17.6 17.6 22.1

FREIGHT CREEK 6000 2/29 21 6.1 8.7 13.8

FRIDAY HILL 6620 2/27 42 10.8 22.4 22.9

FROHNER MEADOWS 6480 2/28 17 4.2 6.6 7.1

FROHNER MEADOWS PILLOW 6480 3/01 SP 5.3 6.2 6.7

GARVER CREEK 4250 2/27 21 5.0 10.3 10.7

GARVER CREEK PILLOW 4250 3/01 SP 4.5 9.6 9.5

GIBBONS PASS 7100 2/27 58 17.0 21.3 20.7

GOAT MOUNTAIN 7000 2/28 13 3.5 5.5 10.2

GOLD CREEK LAKE 7200 2/27 45 9.8 10.9 13.5

GOLD STONE 8100 2/28 45 12.0 12.9 15.1

GRASSHOPPER 7000 2/27 19 4.1 4.2 5.3

GRAVE CREEK 4300 2/27 32 8.9 18.2 16.7

GRAVE CREEK PILLOW 4300 3/01 SP 9.2 16.0 16.4

GRIFFIN CREEK DIVIDE 5150 3/01 22 5.0 8.2 11.1

GUNSLIGHT LAKE 6300 2/29 68 24.5 28.8 36.9

HAND CREEK 5030 2/27 30 6.8 9.6 12.7

HAND CREEK PILLOW 5030 3/01 SP 5.7 4.8 13.6

HAWKINS LAKE 6450 2/27 52 15.9 29.6 28.2

HAWKINS LAKE PILLOW 6450 3/01 SP 13.2 23.2 26.8

HERRING JUNCTION 4850 2/27 53 14.4 22.6 24.4

HOLBROOK 4530 3/02 15 3.9 6.4 9.6

HOOD MEADOW 6600 2/27 31 6.0 9.6 9.6

HOODOO BASIN 6050 2/29 89 33.2 40.4 44.6

HOODOO BASIN PILLOW 6050 3/01 SP 26.3 36.0 40.0

HOODOO CREEK 5900 2/29 39 30.0 36.6 41.8

HOODOO CREEK PILLOW 7850 2/28 39 11.1 10.8 16.8

INDEPENDENCE 6450 3/02 18 4.2 4.8 7.6

INTERGAARD 7200 2/28 31 6.6 8.4 8.9

JAHNKE LAKE TRAIL 6450 3/01 15 3.2 3.9 7.2

JOHNSON PARK 7300 2/27 23 5.8 11.3 14.3

KEELER CREEK 3300 2/27 23 5.8 11.3 14.3

KINGS HILL 7500 3/01 36 9.0 7.7 12.2

KINGS HILL PILLOW 3890 2/28 16 3.3 6.0 8.3

KIWANIS CAMP 3720 2/28 9 2.2 0.0 2.1

KRAFT CREEK PILLOW 4750 3/01 SP 9.2 11.1 12.5

LAKE CREEK 6100 3/01 33 7.8 8.3 8.0

LAKEVIEW CANYON 6930 2/27 28 6.8 12.8 10.4

LAKEVIEW RIDGE 7400 2/27 28 7.0 12.8 9.3

LAKEVIEW RIDGE PILLOW 7400 3/01 SP 8.6 13.9 10.7

LEMHI PASS 7480 3/03 38 6.1 5.2 8.0

LEMHI RIDGE 8100 3/03 40 7.2 6.4 8.9

LEMHI RIDGE PILLOW 8100 3/01 SP 5.1 6.2 9.0

LICK CREEK 6860 2/27 36 8.7 6.4 8.8

LICK CREEK PILLOW 6860 3/01 SP 7.1 6.0 7.7

LITTLE PARK 7400 2/28 45 12.2 11.7 14.4

LOGAN CREEK 4300 2/27 14 3.3 4.4 7.4

LONE MOUNTAIN 8880 2/28 60 18.4 18.6 19.6

LOST HORSE 5940 2/28 68 21.8 24.0 29.5

LOST SOUL 4800 2/27 26 6.4 14.5 15.0

LOWER TWIN 7900 3/01

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN STREAM AND FORECAST POINT	THIS YEAR			PAST RECORD			THIS YEAR			PAST RECORD		
	FORECAST		PERCENTAGE AVERAGE	FORECAST		THOUSAND ACRE FEET	LITER/SEC	FORECAST		THOUSAND ACRE FEET	LITER/SEC	AVERAGE
	Thousands Acre Feet	Percent of Average	Liter/sec	Thousands Acre Feet	Percent of Average	Liter/sec	Thousands Acre Feet	Percent of Average	Liter/sec	Thousands Acre Feet	Percent of Average	Liter/sec
PERIOD												
	April - September			April - July			April - June					
KOOTENAI RIVER below Libby Dam (1)	5,540	79	6,356	7,041	4,740	79	5,346	6,020				
FISHER RIVER near Libby	165	62	264	150	60	248						
YAAK RIVER near Troy	300	57	523	280	56	500						
KOOTENAI RIVER at Loonie (1)	6,410	75	7,948	8,602	5,590	75	6,857	7,498	4,540	75	5,157	6,051
WILLOW HOLLOW RESERVOIR or BUTTE (Million Gallons)	35.7	76	46.8	28.7	76	15.2	184	70	182	263	70	179
WARM SPRINGS CREEK at HEYERS OAH near Anaconda (2)	13.2	72	18.9	11.0	71	15.4						
FLINT CREEK near Southern Cross (3)	55.3	73	75.8	42.8	72	59.5						
WILLOW LOWER WILLOW CREEK RESERVOIR near Hill (5)	9.4	60	11.6	8.8	59	10.2	37.8	10.2	14.9			
MIDDLE FORK ROCK CREEK near Philipsburg	59.0	75	78.2	53.0	75	70.5						
NEVADA CREEK near Finn	11.5	50	23.0	10.5	49	21.3						
BLACKFOOT RIVER near Bonner	680	68	999	600	66	904	515	66	708	465	78	782
CLARK FORK RIVER above Missoula	640	78	816	550	78	644	1,133	1,612	980	71	880	1,379
CLARK FORK RIVER near Conner (7)	1,320	73	1,362	1,815	1,150	71	1,612	1,612	1,612			
BITTERROOT RIVER near Darby	118	66	178	105	64	164						
SKALAHOO CREEK near Hamilton	395	68	580	350	66	532	305	66	464			
BURNET FORK CREEK near Stevensville (8)	44.8	80	56.0	38.0	78	48.7						
BITTERROOT RIVER at Missoula (9)	29.5	79	37.4	25.1	78	32.2						
CLARK FORK RIVER below Missoula	1,010	67	1,504	920	66	1,384	790	66	2,996	1,770	69	1,191
CLARK FORK RIVER at C. Regis	3,200	73	3,450	4,411	2,890	73	3,073	3,928	2,500	73	2,437	3,428
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,435	75	1,913	1,280	74	1,732	1,090	74	1,471			
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,340	72	1,545	1,869	1,220	71	1,401	1,713	1,030	71	1,122	1,453
FLATHEAD RIVER at Columbia Falls (10)	1,670	73	1,847	2,278	1,550	72	1,715	2,142	1,360	72	1,416	1,886
SWAN RIVER near Big Fork	4,550	73	4,943	6,208	4,200	73	4,508	5,721	3,600	73	3,654	4,921
FLATHEAD RIVER near Polson (11)	535	78	689	470	78	604						
CLARK FORK RIVER near Plumb (11)	5,300	73	6,130	7,278	4,870	73	5,538	6,712	4,200	73	4,420	5,759
THOMPSON RIVER near Thompson Falls	8,340	69	9,880	12,153	7,600	69	8,748	11,071	6,530	69	6,902	9,459
PROSPECT CREEK at Thompson Falls	180	69	261	155	67	233						
CLARK FORK RIVER at Whitehorse Rapids (12)	100	70	142	92.5	70	132						
	9,250	68	13,575	8,420	68	12,351	7,185	68	10,570			

(1) Adjusted for storage in Lake Koocanusa.
 (2) Adjusted for storage in Silver Lake, diversions and pumping from Georgetown Lake.
 (3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
 (4) Sun Flats Creek at Havre and Boulder Creek at Havre.
 (5) Sun of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
 (6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.
 (7) Adjusted for storage in Painted Rocks Reservoir.
 (8) Adjusted for diversion into Sunset Highline Canal.
 (9) Difference in observed flow Clark Fork above and below Missoula.
 (10) Adjusted for storage in Hungry Horse Reservoir.
 (11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
 (12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

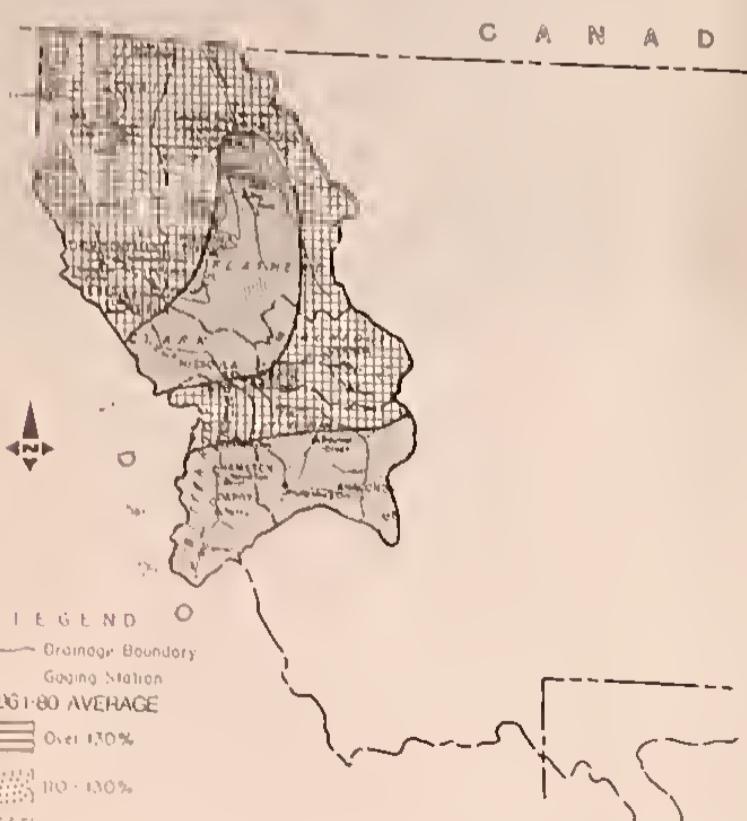
STREAM OR AREA	Flow Period		
	Setting Section	Setting Section	Setting Section
Tobacco	Fair	Poor	
Little Bitterroot	Fair	Poor	
Mission Valley	Fair	Fair	
Flin Creek	Fair	Fair	
Upper Clark Fork	Fair	Fair	
Nevada Creek	Fair	Poor	
Blackfoot	Fair	Poor	
West-side Bitterroot	Fair	Fair	
East-side Bitterroot	Fair	Fair	
Bitterroot River	Fair	Fair	
Lower Clark Fork	Fair	Poor	

Deep snow needed

Snow pack improved slightly in the southern portions of the Clark Fork and Bitterroot but remained the same or declined in other areas.

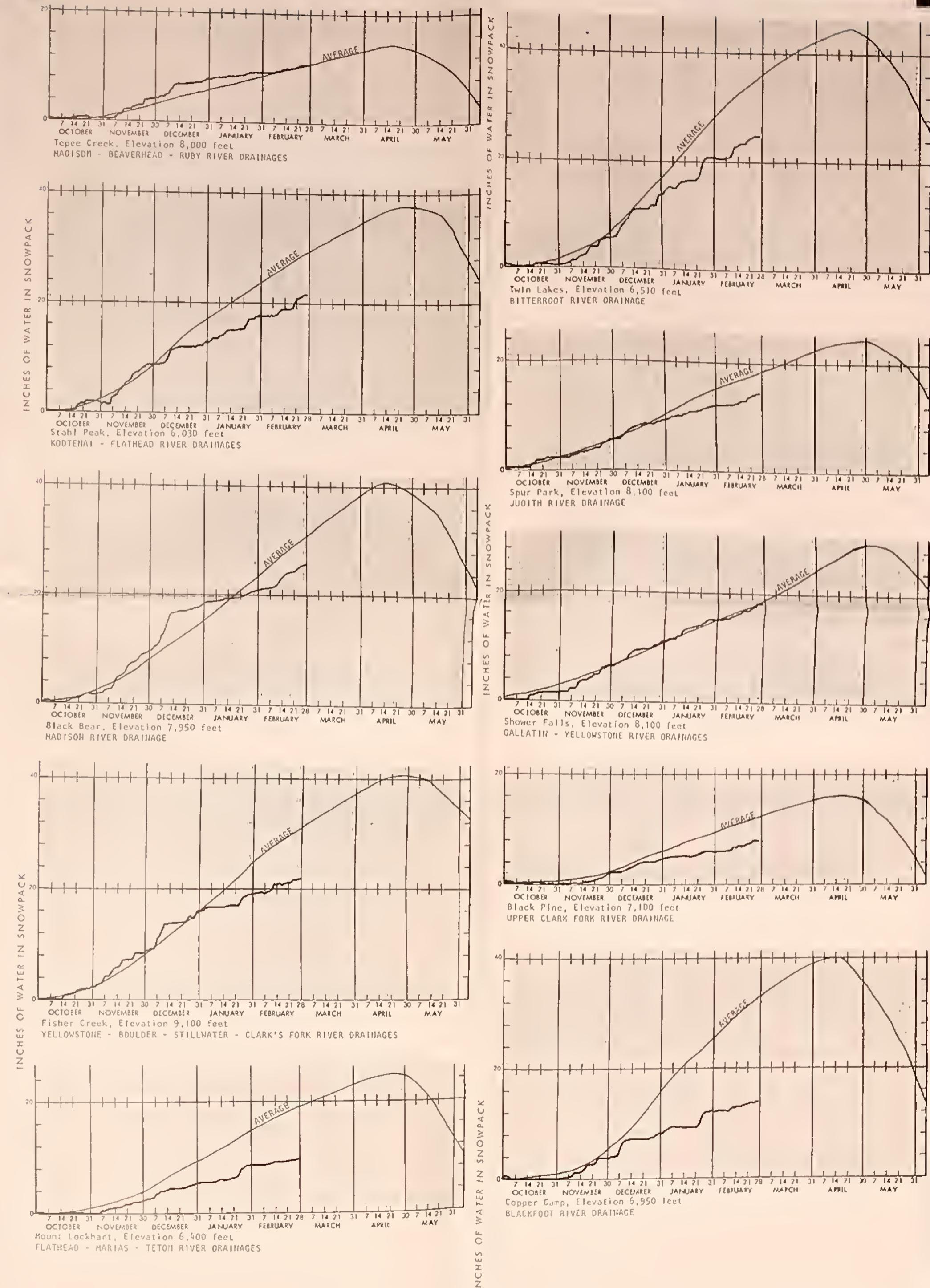
Most snow courses along the Continental Divide in the Blackfoot and Flathead River drainages have water contents that are near minimum of record. The Swan and Mission Mountains show a little better snow cover because of good early season snows.

It appears that weather patterns may be changing and a little more moisture could be directed into this



Mountain streams are starting to lose their ice cover and will soon be ice-free.

SNOW PILLOW DATA



SATELLITE SNOW COVER



DATA PROVIDED BY NOAA/NESS

Snow Covered Area

Scale 1:2,500,000

MISSOURI RIVER BASIN Above Canyon Ferry Dam

DATE	PERCENT SNOW	AVERAGE SNOWLINE ELEVATION IN FEET
November 29, 1983	99.1	3940
December 20, 1983	100	3800
January 9, 1984	72	5720
January 31, 1984	78	5440
February 8, 1984	74	5630
February 27, 1984	100	3800



Shallow snowpacks expose many obstacles not normally seen by winter travelers.

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH February 29, 1984

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average

COLUMBIA					
Kootenai	Koocanusa	5,748.2	2,789.0	2,190.0	---
Flathead	Hungry Horse	3,451.0	2,507.0	2,831.0	2,213.0
	Flathead Lake	1,791.0	787.4	752.8	934.1
	Camas (4)	45.2	29.5	31.2	12.3
Clark Fork	Mission Valley (8)	100.3	55.4	43.7	38.1
	Georgetown Lake	31.0	27.1	26.6	25.2
	Lower Willow Creek	4.9	3.3	1.6	1.6
	Nevada Creek	12.6	6.3	5.2	4.8
Bitterroot	Noxon Rapids	334.6	322.8	315.4	312.2
	Painted Rocks	31.7	---	---	16.1
	Como	34.9	23.9	---	12.6
MISSOURI					
Beaverhead	Lima	84.0	55.7	51.4	36.2
	Clark Canyon	257.2	171.8	165.0	141.2
Ruby	Ruby	38.8	27.8	27.6	26.7
Madison	Hebgen Lake	377.5	261.9	273.0	224.6
Gallatin	Ennis Lake	41.0	31.2	30.7	35.7
Missouri	Middle Creek	8.0	3.8	3.8	3.6
	Canyon Ferry	2,043.0	1,647.0	1,691.0	1,561.0
	Hauser & Helena	61.9	63.0	63.0	60.1
	Helena Valley	10.4	---	---	---
	Lake Helena	10.4	10.9	10.9	9.9
	Holter Lake	81.9	79.6	81.0	63.6
Smith	Fort Peck Lake	18,910.0	15,900.0	15,640.0	14,830.0
	Smith River	10.6	9.6	8.6	6.9
	Newlam Creek	12.4	8.6	8.7	9.2
Musselshell	Bair	7.0	3.2	5.2	4.7
	Martinsdale	23.1	14.2	18.3	9.5
Sinn	Deadman's Basin	72.2	---	63.1	46.3
	Gibson	99.1	54.7	61.8	43.9
	Willow Creek	32.2	24.3	24.2	20.1
	Pishkun	32.0	19.4	19.9	17.8
Marias	Lower Two Medicine	11.9	---	---	7.0
	Four Horns	19.2	---	---	12.5
	Swift	30.0	13.1	14.9	15.2
	Lake Frances	111.9	47.2	85.1	70.1
Milk	Elwell (Tiber)	1,347.0	695.0	693.7	542.1
	Beaver Creek	3.5	3.1	3.1	1.7
	Fresno	127.2	24.6	13.2	58.5
	Nelson	66.8	39.1	44.4	38.7
HUDSON BAY					
St. Mary's	Lake Sherburne	64.3	35.2	35.8	21.9
YELLOWSTONE					
Stillwater	Mystic Lake	21.0	4.4	3.9	7.3
Clark's Fork	Cooney	27.4	17.0	17.6	14.6
Tongue	Tongue River	68.0	15.2	18.4	34.4
Bighorn	Bighorn Lake	1,356.0	839.0	962.6	590.4

AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

Canada
Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section

Federal
Alberta Environment
Technical Services Division

Department of the Army - Corps of Engineers
Department of Agriculture - Forest Service
- Soil Conservation Service
Department of Commerce - National Environmental Satellite Service
- National Weather Service
Department of Interior - Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation
Department of Energy - Bonneville Power Administration

STATE AGENCIES

Montana Conservation Districts
Montana Department of Fish, Wildlife and Parks
Montana Department of Natural Resources and Conservation
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

PRIVATE ORGANIZATIONS

The Anaconda Company
Big Sky of Montana
Butte Water Company
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

